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Lee

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(54) **HELMET**

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A42B 1/24 (2006.01)
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USPC **2/424**; 2/422; 2/425

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USPC 2/410, 6.3, 6.5, 6.7, 422, 424, 425, 2/15, 10, 9, 427, 443; D29/104, 105, 106, D29/107
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,383,706 A * 5/1968 Lobelle 2/6.5
3,473,166 A * 10/1969 Lobelle 2/6.5
3,631,540 A * 1/1972 Penny 2/410
4,199,823 A * 4/1980 Jenkins et al. 2/424
4,292,688 A * 10/1981 Ellis 2/6.4
4,397,047 A * 8/1983 Nava 2/424
4,559,679 A * 12/1985 Downey 24/615

(Continued)

FOREIGN PATENT DOCUMENTS

FR 2593036 A1 * 7/1987
GB 2024000 A 1/1980

(Continued)

OTHER PUBLICATIONS

English Machine Translation of French Patent FR 2593036; Inventor: Landi Cesare; 3 pgs. total.*

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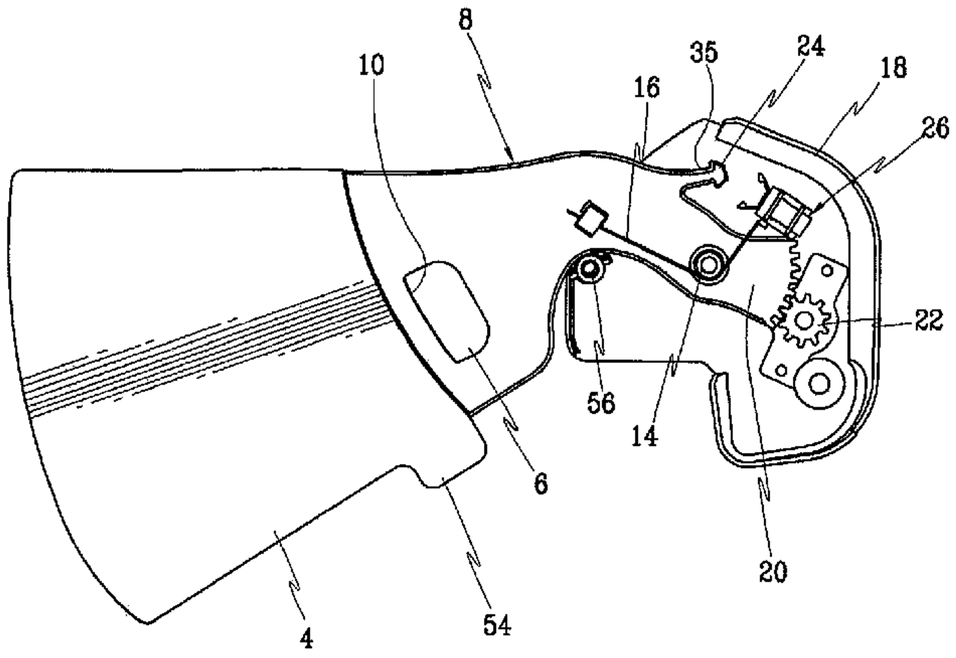
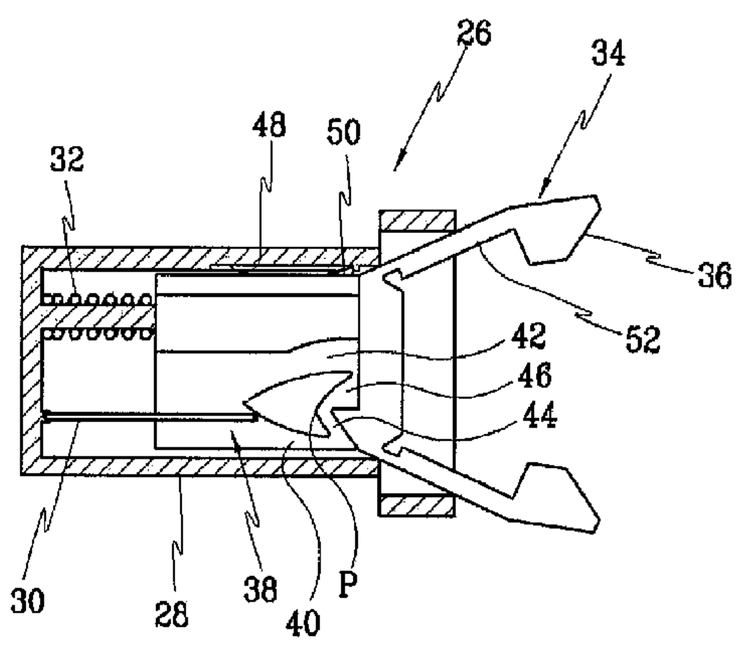
(57) **ABSTRACT**

The present invention provides a helmet that is convenient in use. The helmet of the present invention includes a main body defining a space receiving a head of a wearer, a holder that is elastically coupled to the main body to be capable of pivoting and has a pushing member, a shield that is detachably coupled to the holder so that the wearer can securely obtain a viewing field, and a locking/unlocking unit that maintains or releases an open state of the holder when the holder pivots to the open state. The helmet structure as above can open and close the face shield by simply pushing the shield upward.

7 Claims, 9 Drawing Sheets





U.S. PATENT DOCUMENTS

4,571,747	A *	2/1986	Briggs	2/424
4,581,776	A *	4/1986	Kie	2/425
4,689,836	A *	9/1987	Vitaloni	2/424
4,769,857	A *	9/1988	Cianfanelli et al.	2/424
4,866,792	A *	9/1989	Arai	2/424
4,926,854	A *	5/1990	Bode	128/201.23
5,177,816	A *	1/1993	Schmidt et al.	2/424
5,182,816	A *	2/1993	Arai	2/424
5,185,889	A *	2/1993	Kamata	2/424
5,329,642	A *	7/1994	Dampney	2/424
5,333,329	A *	8/1994	Hong	2/424
5,444,875	A *	8/1995	Taniuchi	2/424
5,671,483	A *	9/1997	Reuber	2/424
5,813,048	A *	9/1998	Thom	2/6.5
5,890,233	A *	4/1999	Kaffka	2/424
5,987,651	A	11/1999	Tanaka	
5,987,652	A *	11/1999	Fowler	2/424
6,047,409	A *	4/2000	Simpson	2/424
6,161,225	A *	12/2000	Arai	2/424
6,182,298	B1 *	2/2001	Dampney	2/422
6,226,803	B1 *	5/2001	Tanaka	2/424
6,260,213	B1 *	7/2001	Eom et al.	2/424
6,282,726	B1 *	9/2001	Noyerie et al.	2/6.5
6,301,719	B1 *	10/2001	Goodhand et al.	2/422
6,557,185	B1 *	5/2003	Lee	2/424
6,622,313	B1 *	9/2003	Choi et al.	2/424
7,207,072	B2 *	4/2007	Halsnes et al.	2/424
7,210,174	B2 *	5/2007	Yeh	2/424
7,398,561	B2 *	7/2008	Kim et al.	2/424
7,546,645	B2 *	6/2009	Goodhand et al.	2/424
7,841,026	B2 *	11/2010	Makris et al.	2/424
8,069,499	B2 *	12/2011	Isobe	2/424
2003/0182716	A1 *	10/2003	Wu	2/424
2003/0182717	A1 *	10/2003	Choi et al.	2/424
2003/0196255	A1 *	10/2003	Arai	2/424
2004/0199982	A1 *	10/2004	Wang-Lee	2/424
2008/0189836	A1 *	8/2008	Goodhand et al.	2/424
2009/0044316	A1 *	2/2009	Udelhofen	2/424
2010/0050326	A1 *	3/2010	Lee	2/422

FOREIGN PATENT DOCUMENTS

JP	07-003514	A	1/1995
JP	10-298818	A	11/1998
KR	10-1999-0015171	A	11/1999
KR	10-2002-0090634	A	12/2002
WO	8601694	A1	3/1986

* cited by examiner

FIG. 1

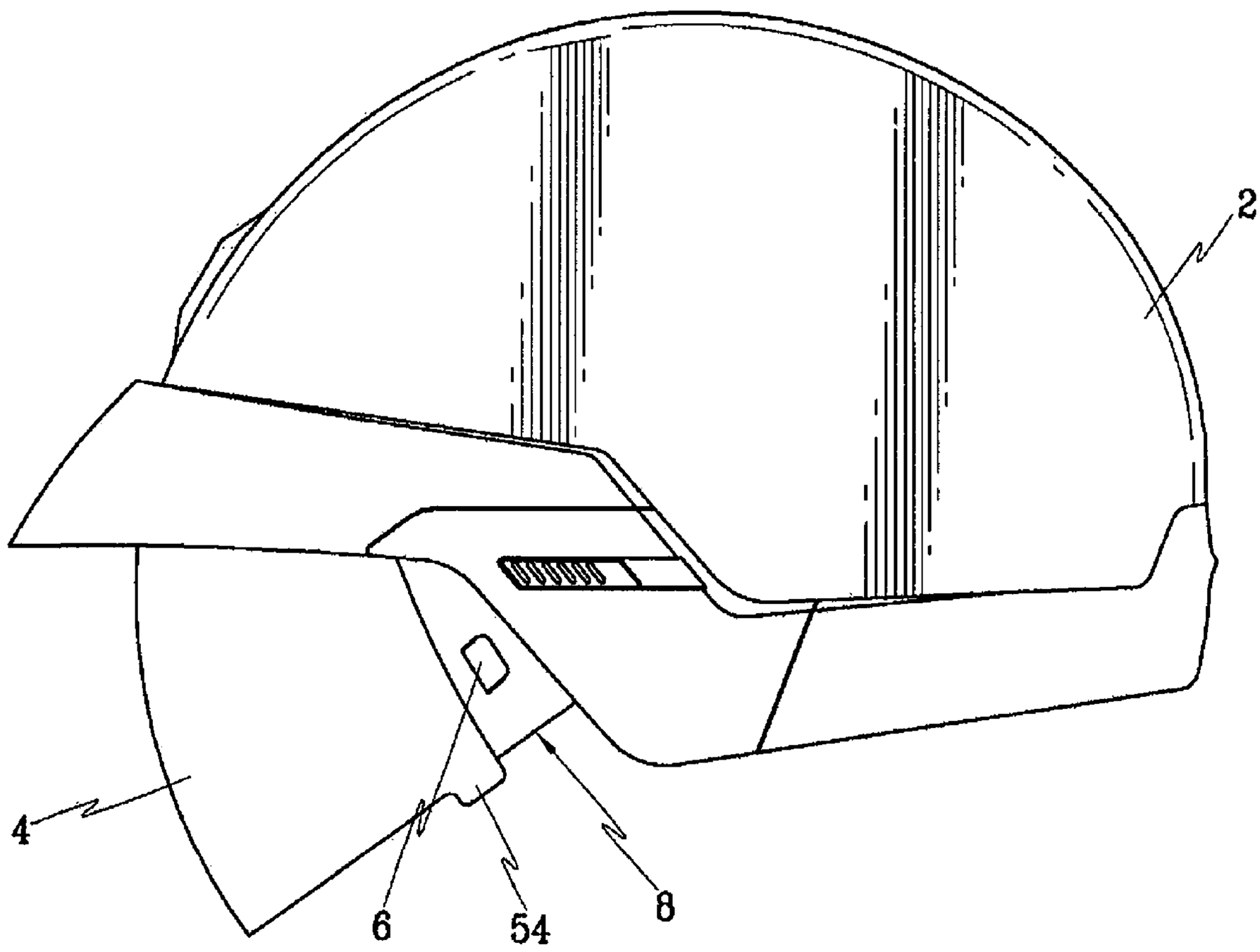


FIG. 2

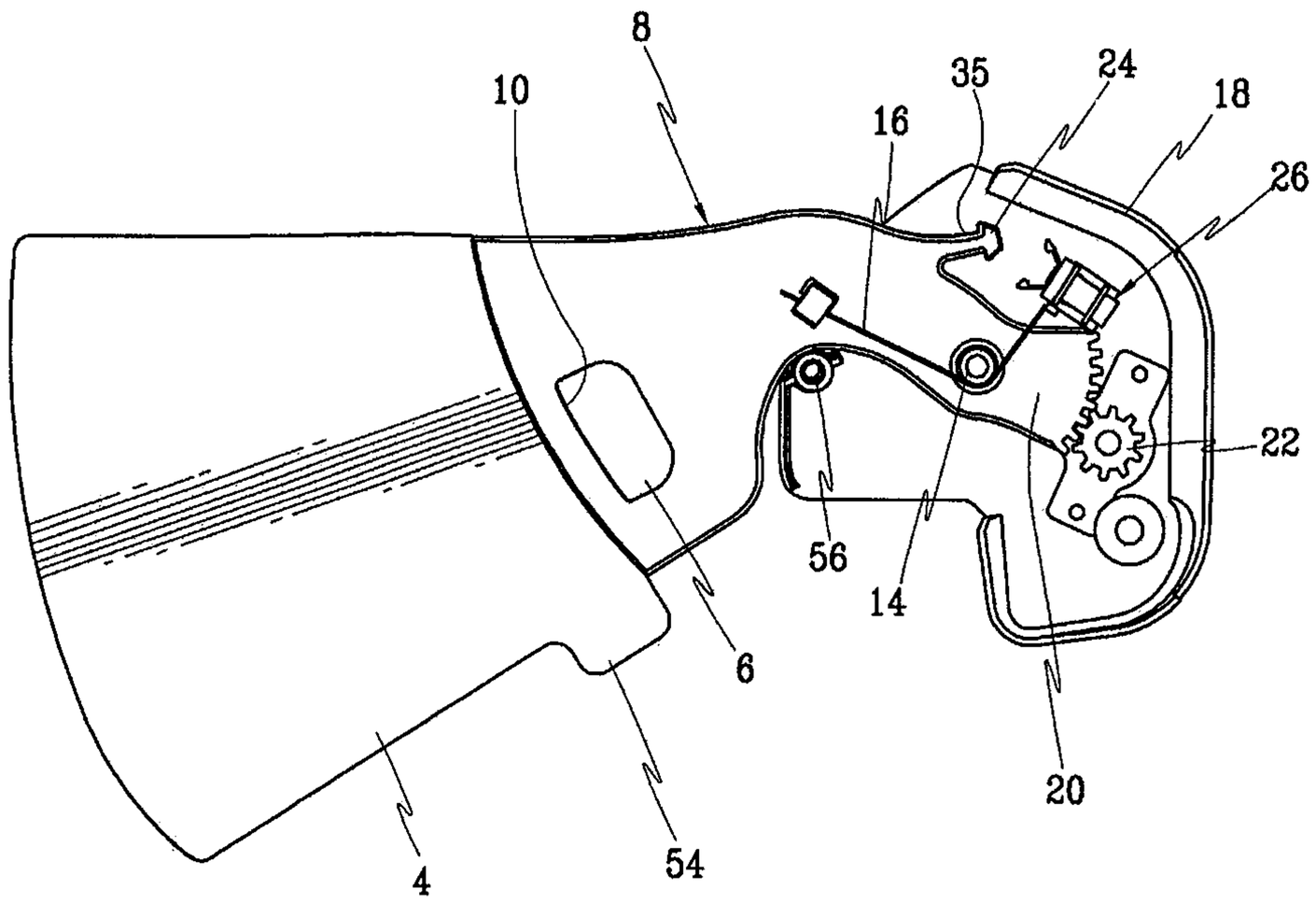


FIG. 3

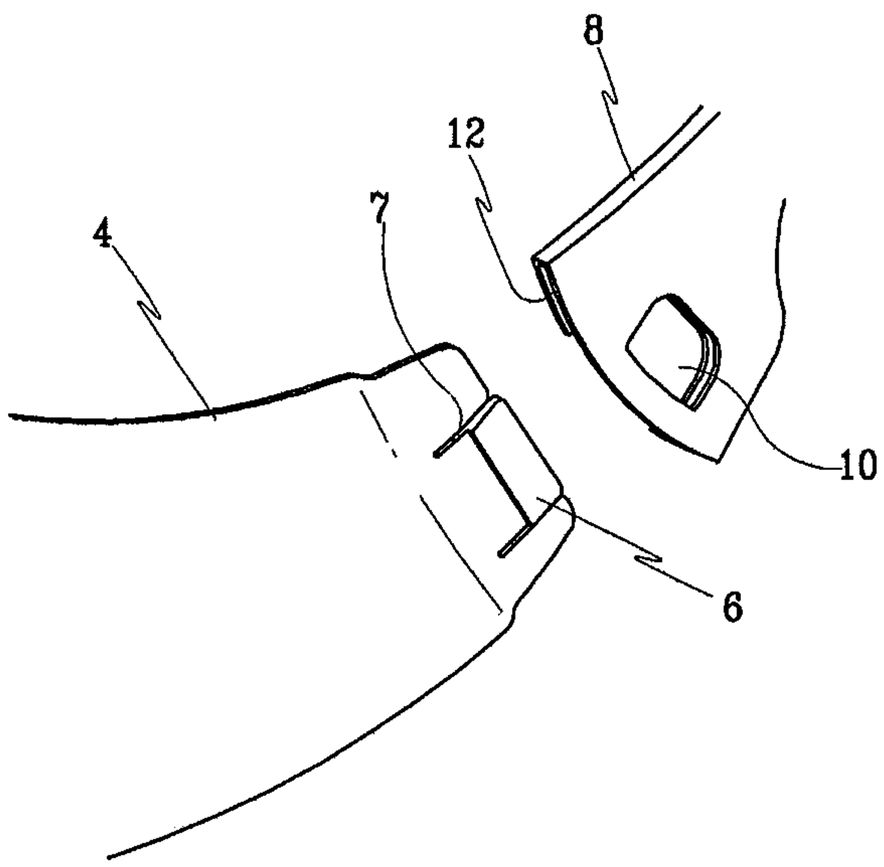


FIG. 4A

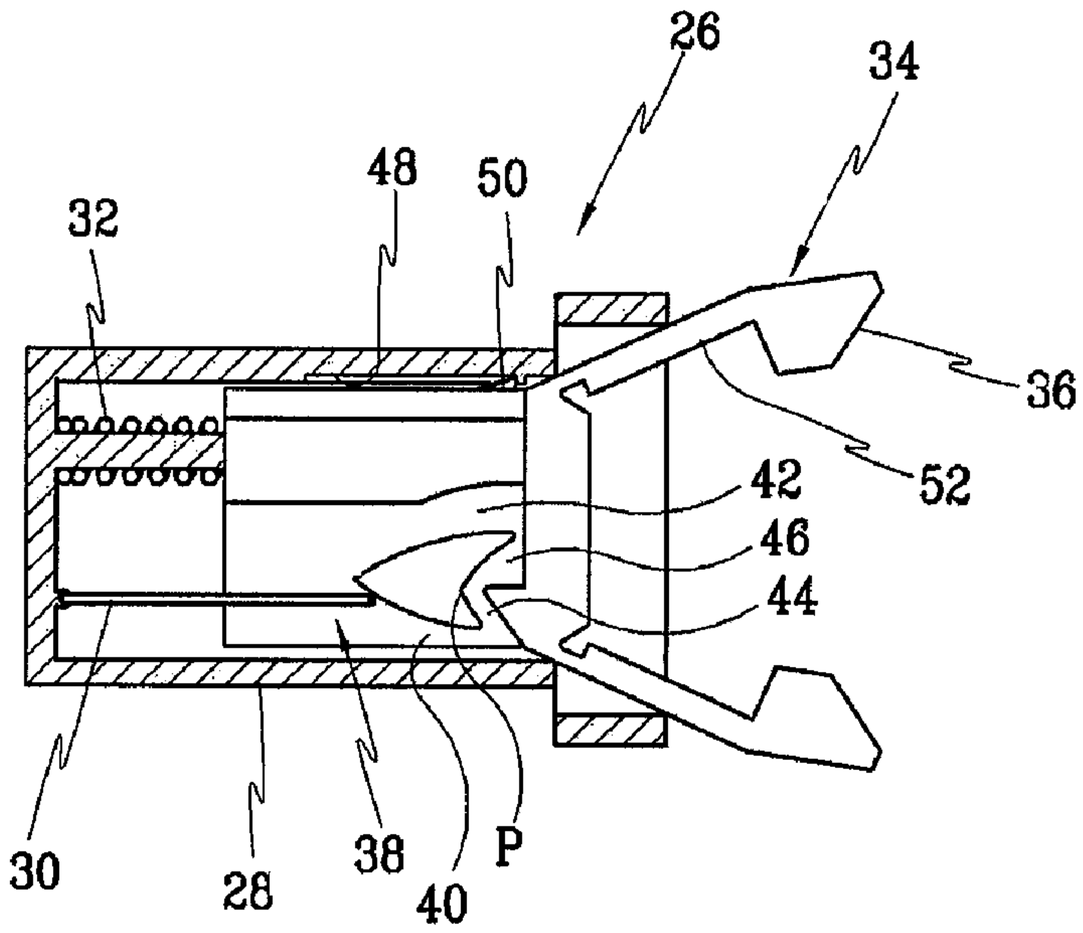

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FIG. 4B

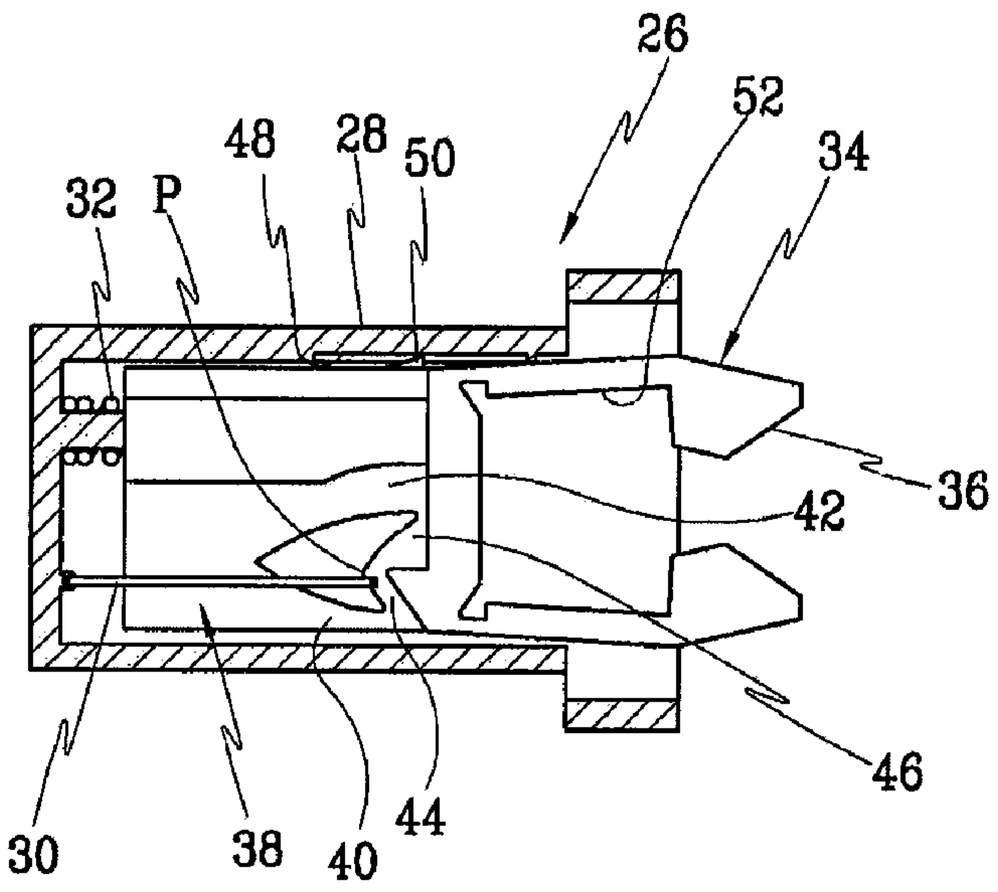
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FIG. 5

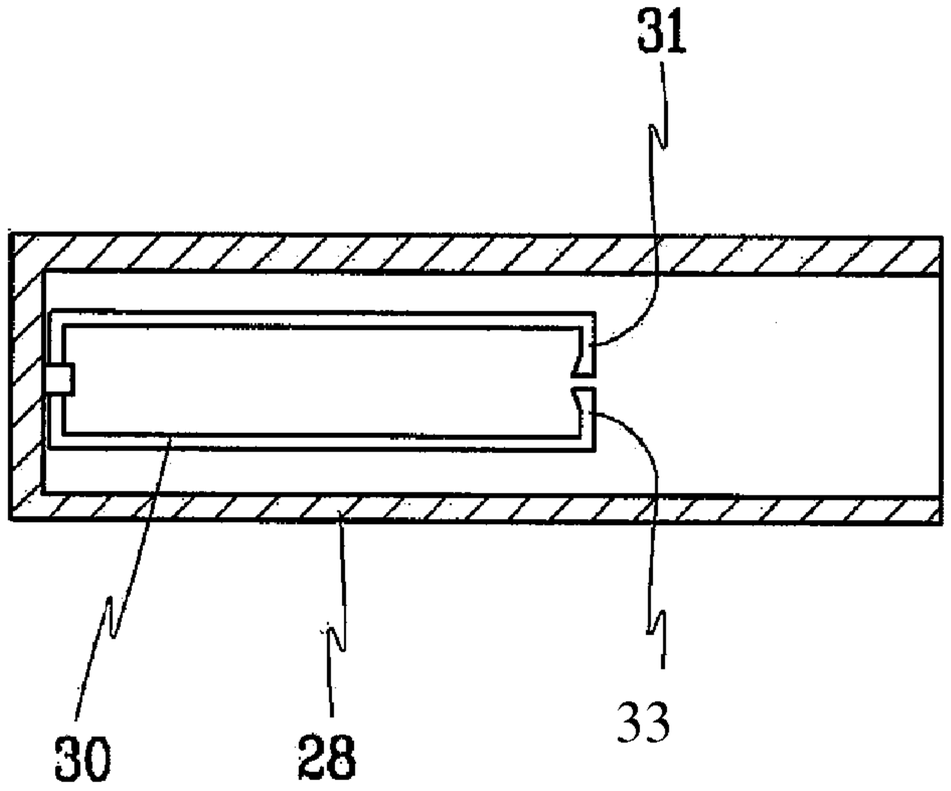


FIG. 6

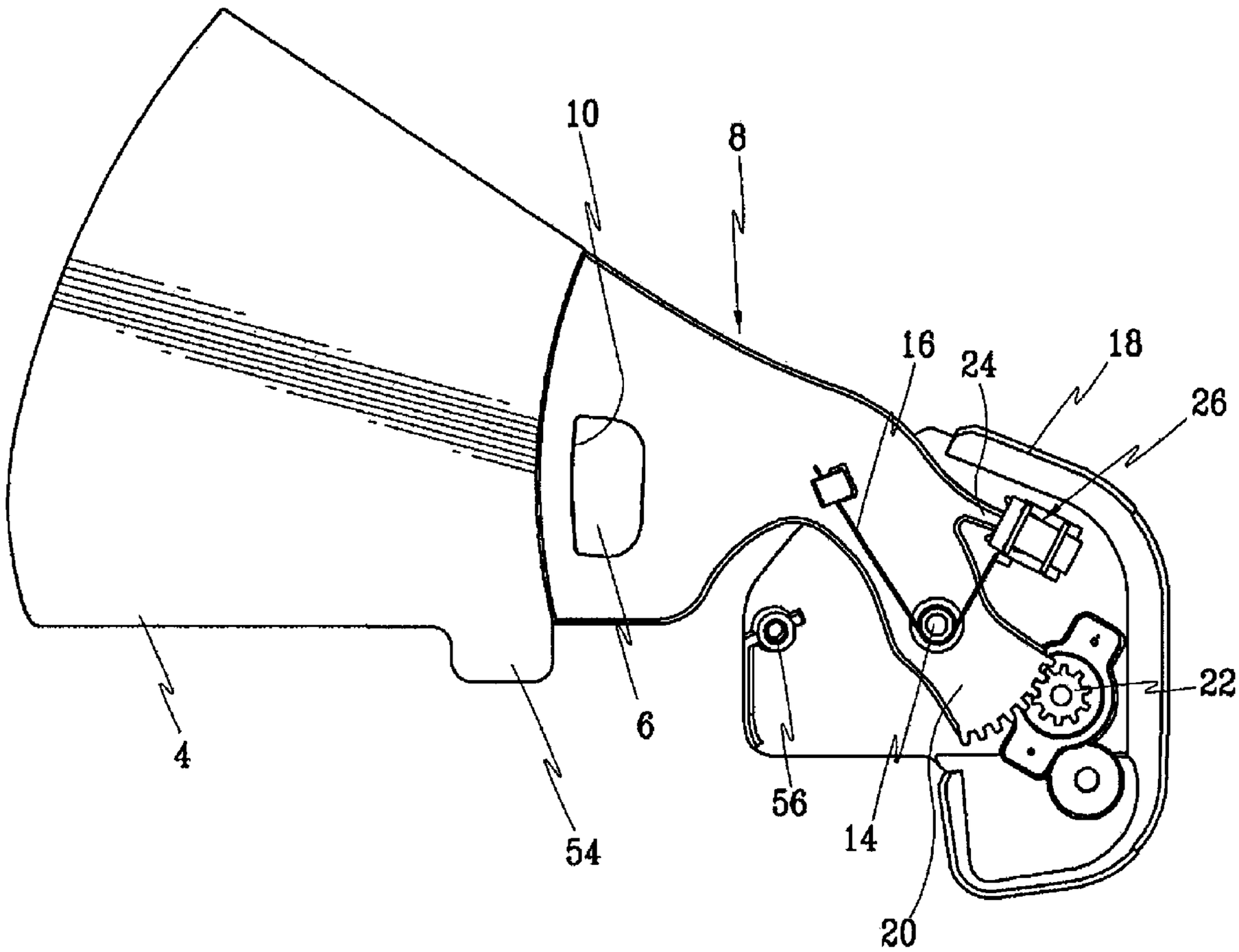


FIG. 7

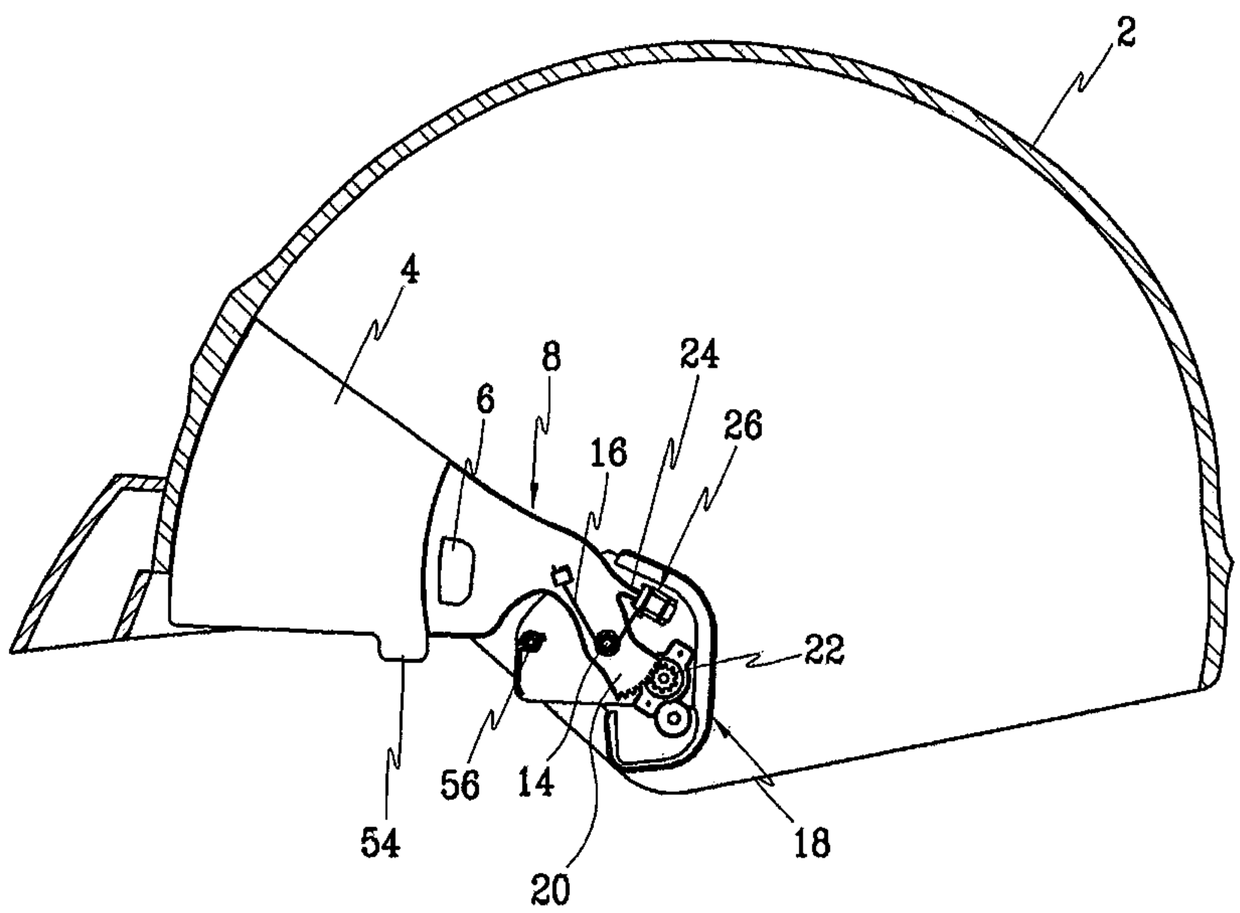


FIG. 8

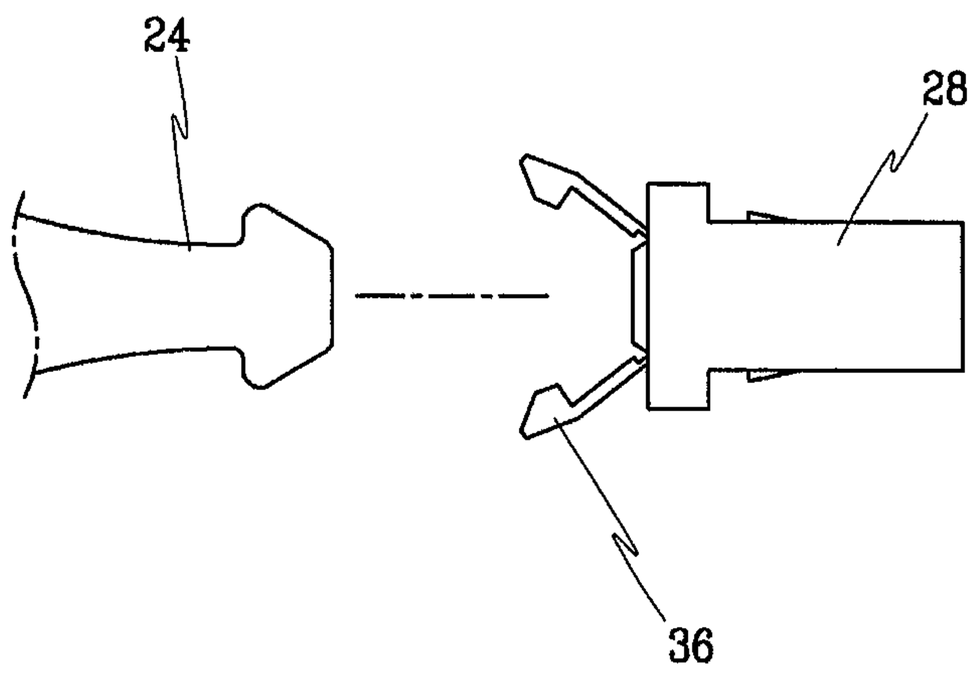
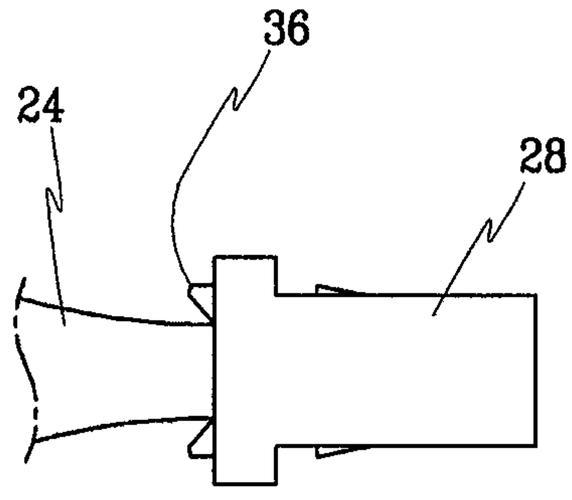


FIG. 9



HELMET

TECHNICAL FIELD

The present invention relates to a helmet. More particularly, the present invention relates to a helmet that is designed to have an easily opened and closed face shield installed on a front portion of the helmet and to minimize noise caused by wind resistance.

BACKGROUND ART

When driving or riding a motorcycle or a racing car, a driver or passenger can be protected from an accident by wearing a helmet.

Such a helmet includes a main body that protects a head of a user and a face shield that is installed on a front portion of the main body to protect a viewing field of the user.

The face shield is installed to pivot in a vertical direction of the main body to enhance a ventilation property. A lever is installed at a side of the face shield to facilitate the pivotal motion of the face shield.

The face shield is generally formed of a transparent or translucent synthetic resin. Recently, the face shield has been formed of a material that can screen ultraviolet rays or is colored to block the ultraviolet rays.

However, a helmet that is structured to open and close the face shield using the lever is inconvenient since the user has to ascend and descend the lever by himself/herself.

Furthermore, in the helmet using the lever, since the lever is structured to protrude, noise is considerably generated by wind colliding with the lever during a high speed drive.

The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

BRIEF SUMMARY OF THE INVENTION

Technical Problem

The present invention has been made in an attempt to solve the above problems, and is designed to have an easily openable and closable face shield which protects a face of a user and does not generate any noise that may be caused by a unit for opening and closing the face shield.

Technical Solution

To achieve the objects, the present invention provides a helmet including:

a main body defining a space receiving a head of a wearer;

a holder that is elastically coupled to the main body to be capable of pivoting and has a pushing member;

a shield that is detachably coupled to the holder so that the wearer can securely obtain a viewing field;

a locking/unlocking unit that maintains or releases an open state of the holder when the holder pivots to the open state.

In a state where a catching projection of the holder is inserted and caught, when the locking/unlocking unit of the exemplary embodiment is further pushed, the catching state of the catching projection of the holder is released.

Advantageous Effects

The helmet according to the present invention is designed to easily open and close by simply pushing the face shield upward.

Furthermore, since the face shield is detachably coupled to the holders that are pivotally installed on the main body, the user can select a face shield suiting his/her taste and assemble the selected face shield.

DESCRIPTION OF DRAWINGS

FIG. **1** is a side view of a helmet according to an exemplary embodiment of the present invention.

FIG. **2** is a view of a face shield opening/closing unit according to an exemplary embodiment of the present invention, illustrating a closing position of a face shield.

FIG. **3** is a view illustrating a shield coupling structure according to an exemplary embodiment of the present invention.

FIGS. **4**A and **4**B are, respectively, a view illustrating a locking/unlocking unit according to an exemplary embodiment of the present invention.

FIG. **5** is a view illustrating a wire member installing structure related to the present invention.

FIG. **6** is a view of the shield opening/closing unit according to an embodiment of the present invention illustrating a shield open state.

FIG. **7** is a view illustrating a state where the shield opening/closing unit is applied to a main body of the helmet according to an exemplary embodiment of the present invention.

FIG. **8** is a view illustrating a state before a stopper related to the present invention is coupled.

FIG. **9** is a view illustrating a state after the stopper related to the present invention is coupled.

DETAILED DESCRIPTION OF THE INVENTION

The following will describe a best mode that can achieve the technical objects of the present invention.

In the present exemplary embodiment, the reference number **2** indicates a main body of a helmet. The main body **2** defines a space that can receive a head of a user, and the main body **2** is structured to endure an impact applied from an external side. The main body **2** may be formed in a conventional structure.

The main body **2** extends rearward to define a rear surface, thereby protecting top, sides, and rear portions of the head of the user. A face shield **4** is provided on a front portion of the main body **2**.

As shown in FIGS. **2** and **3**, the face shield **4** is formed having a predetermined curvature and provided at both sides with respective coupling protrusions **6**.

The coupling protrusions **6** protrude from a surface of the face shield **4** and are detachably coupled to holders **8** that are pivotally coupled to the main body **2**.

In order to detachably couple the face shield **4** to the holders **8**, the holders **8** are provided with coupling holes **10** in which the coupling protrusions **6** are respectively inserted.

Each of the coupling protrusions **6** is designed to be cut at both sides thereof to have an elastic force. Each of the holders **8** to which the coupling protrusions **6** are coupled, is provided with a guide groove **12** in which the shield **4** can be inserted. Therefore, when the shield **4** is inserted in the guide grooves **12**, the coupling projections **6** are inserted in the coupling holes **10**.

In a state where the shield **4** is coupled to the holders **8**, a top portion of the shield **4** and top portions of the holders **8** are positioned in an approximately straight line.

Each of the holders **8** is pivotally coupled to the main body **2** by a hinge pin **14** and installed such that the face shield **4** is biased in a closing direction by a spring **16**.

The springs **16** are wound around the hinge pins **14** by at least one turn, in a state of which first and second ends of the springs **16** are respectively fixed on the holders **8** and the main body **2**.

The holders **8** achieve the coupling to the main body **2** by being substantially fixed on cover members **18** that are securely fixed on the main body **2**.

That is, the holders **8** are pivotally coupled to the cover members **18**. Arc-shaped gears **20** are formed on rear ends of the holders **8**. The arc-shaped gears **20** are engaged with pinion gears **22** that are rotatably installed on the cover members **18**, thereby preventing the holders **8** from quickly moving in an opening/closing direction by the biasing force of the springs **16**.

A pushing member **24** protrudes from each holder **8**. The pushing state of the pushing members **24** may be maintained or released by stoppers **26** mounted on the cover members **18**.

The stoppers **26** are installed on a pivotal motion track of the pushing members **24**. The pushing members **24** have a neck portion smaller than a front end thereof.

A conventional one-touch type locking/unlocking mechanism or the like may be used as the stopper **26** of this exemplary embodiment. That is, as shown in FIGS. **4** and **5**, each stopper **16** includes a housing **28** fixed on the cover member **18** and a wire member **30** that is bent in a rectangular shape and pivotally coupled inside the housing **28**.

A hook member **34** is inserted inside the housing **28** and biased to an external side of the housing by a spring **32**.

The hook member **34** includes a pair of folders **36** for fixing or releasing the pushing member **24**. The folders **36** are integrally formed with a locking/unlocking unit **38**.

The locking/unlocking unit **38** has passages **40** and **42** through which open ends **31** and **33** of the wire member **30** can pass. The passages **40** and **42** communicate with each other by inclined grooves **44** and **46** that are inclined in opposite directions.

The passages **40** and **42** and the inclined grooves **44** and **46** are identically or similarly formed on front and rear surfaces of a main body of the hook member **34** so that the open ends **31** and **33** of the wire member **30** can be respectively located on the passages formed on the front and rear surfaces.

The locking/unlocking unit **38** of this exemplary embodiment is illustrated by way of example. Therefore, the present invention is not limited to this exemplary embodiment. That is, other similar one-touch type mechanisms may be used as the locking/unlocking unit **38**.

The open ends **31** and **33** of the wire member **30** are respectively located contacting the front and rear surfaces of the hook member **34**. The housing **28** is provided at an inside with a groove **48** in which a protrusion **50** of the hook member **34** is inserted. Therefore, although the hook member **34** is biased by the spring **32**, the hook member **34** is not separated from the housing **28**.

The pair of folders **36** has arm portions **52** each having an elastic force. Therefore, when the folders **36** move out of the housing **28**, they are widened from each other. When the folders **36** move inside the housing **28**, the folders **36** move close to each other.

Therefore, when the pushing member **24** pushes the hook member **34**, the hook member **34** moves into the housing **28**. At this point, the folders **36** move close to each other, by which the pushing member **24** is clamped by the folders **36**.

A pressing portion **54** is formed protruding from a lower end of the face shield so that the face shield **4** can move upward by the user pushing the pressing portion **54**. The cover member **18** is provided with a protrusion **56** restricting the pivotal motion of the holder **8**.

According to the helmet structure as described, the face shield **4** is installed on the front portion of the main body **2**. In FIG. **1**, the face shield **4** is in a closed state.

In the closed state of the face shield **4** as shown in FIG. **1**, the pinion gear **22** is engaged with a lower end of the arc-shaped gear **20** of the holder **8**, as shown in FIG. **2**.

In the state of FIG. **2**, the pushing member **24** formed on the holder **8** is separated from the stopper **26** and biased by the spring **16** counterclockwise in FIG. **2**.

In this state, the face shield **4** cannot rotate counterclockwise anymore by the protrusion **56**.

In this state, when the user pushes the shield **4** upward, the holder **8** pivots clockwise about the hinge pin **14**.

At this point, the pushing member **24** moves toward the housing **28** of the stopper **26** and contacts the pair of the folders **36**, in the course of which the pushing member **24** pushes the hook member **34**.

By the above operation, the hook member **34** moves toward the housing **28** while compressing the spring **32**.

At this point, the pair of folders **36** move toward each other while advancing into the housing **28**. Since the pushing member **24** is provided with the neck portion **35** smaller than the front end, the neck portion **35** is fixed by being enclosed by the folders **36** moving toward each other. The state shown in FIG. **8** changes to the state shown in FIG. **9**.

At the same time, when the hook member **34** moves inside the housing **28**, the front end of the wire member **30** installed in the housing **28** reaches the inclined groove **46** while advancing toward the passage **40** of the hook member **34**.

When the shield **4** is not pushed anymore during the above process, the front end of the wire member **30** is hooked on a point P where the inclined groove **44** is connected to another inclined groove **46** (see FIG. **4**B).

The point P is formed in a V-shape so that the front end of the wire member **30** can be hooked therein.

Then, as shown in FIGS. **6** and **7**, the shield **4** maintains the opened state.

In this state where the shield **4** is opened, when the shield **4** is pushed upward, the front end of the wire member **30**, which is located between the inclined grooves **44** and **46**, moves toward the passage **42** while advancing toward the inclined groove **46**.

In this state where the shield **4** is opened, when the shield **4** is pushed upward, the front end of the wire member **3**, which is located between the inclined grooves **44** and **46**, moves toward the passage **42** while advancing toward the inclined groove **46**.

In this state, when the shield **4** is not pushed, the hook member **34** is pushed out of the housing **28** by the biasing force of the spring **32**.

Therefore, the folders **36** catching the pushing member **24** move away from each other to release the pushing member **24** and thus the pushing member **24** moves the shield **4** to the closed position as the holder **8** rotates counterclockwise by the biasing force of the spring **16**.

When the face shield **4** is pushed upward as described above, the face shield **4** maintains the open state. When the face shield **4** is further pushed upward, the shield **4** is closed.

At this point, a pressing portion **54** is provided to effectively push the face shield **4** upward. The pressing portion **54** is effective when the face shield **4** is pushed upward in a state where it is opened as shown in FIG. **7**.

According to the helmet of the exemplary embodiment, the face shield may be selected in accordance with a color, a shape, and the like, and a combination thereof.

FIG. **3** shows a coupling unit of the shield. The coupling projections **6** formed on the left and right ends of the face shield **4** have an elastic force by the cutting lines **7**. Therefore, when the coupling projections **6** are pushed into the guide grooves **12** formed on the holders **8**, the coupling projections **6** are fixed in the coupling holes **10**.

In this state, when the face shield **4** is pulled after the coupling projections **6** are pressed, the face shield **4** is separated from the holders **8**. Therefore, the face shield **4** can be easily replaced.

While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

INDUSTRIAL APPLICABILITY

The helmet according to the exemplary embodiment of the present invention can be used by a motorcycle driver or a racing car driver. Therefore, the present invention can be applied in a helmet manufacturing field industry.

What is claimed is:

1. A helmet comprising:

a main body defining a space adapted to receive a head of a wearer;

a holder that is elastically coupled to the main body to be capable of pivoting and has a pushing member; and

a face shield that is detachably coupled to the holder so that the wearer can securely obtain a viewing field; and a stopper that maintains or releases an open state of the holder when the holder pivots to the open state,

wherein the stopper comprises:

a housing;

a hook member that is elastically installed inside the housing and has a pair of folders; and

a locking/unlocking unit for moving the folders of the hook member into the housing or out of the housing an elastic force,

wherein the locking/unlocking unit comprises:

a wire member that is pivotally installed in the housing;

two passages that are formed on the hook member, the wire member to be disposed and advanced along the passages; and

two inclined grooves that are formed between the passages, connected to the passages, and inclined in an opposite direction to each other,

wherein the locking/unlocking unit defines a recessed point where the inclined grooves meet so that a front end of the wire member is hooked in the recessed point to hold the holder in the open state.

2. The helmet of claim **1**, wherein coupling protrusions are elastically formed on both side ends of the face shield and are capable of being coupled to respective coupling holes formed in the holder.

3. The helmet of claim **1**, wherein the holder is elastically coupled to the main body to be capable of pivoting and provided at a rear end with an arc-shaped gear.

4. The helmet of claim **3**, wherein the arc-shaped gear is engaged with a pinion gear to reduce a pivot speed when the holder pivots to a closed state.

5. The helmet of claim **1**, wherein the holder is provided with a guide groove for fixing the face shield.

6. The helmet of claim **1**, wherein the face shield is provided at a lower end with a pressing portion for pushing the face shield upward.

7. The helmet of claim **1**, wherein the pushing member is provided with a neck portion smaller than a front end thereof.

* * * * *